REMARKS

The present Response is filed in response to the Final Rejection of April 23, 2002 and the Applicant respectfully requests entry of the present Response before reconsidering of the present Application. The Applicant also respectfully requests an extension of the period in which to respond to the present Action.

Claims 73-89 are presently pending in the Application and claims 73-76, 79 and 80 are rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,457,611 to Verderber for an AMBIENT AIR COOLED LIGHT EMITTING INSTRUMENT, hereafter referred to as "Verderber", and claims 77, 82-88 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Verderber.

Claims 78 and 89 are rejected under 35 U.S.C. 103(a) as unpatentable over Verderber in view of, U.S. Patent No. 5,341,275 to Ghandehari for a COMPACT LIGHT SOURCE FOR FIBER OPTICS ILLUMINATION, hereafter referred to as "Ghandehari", and claim 81 is rejected under 35 U.S.C. 103(a) as unpatentable over Verderber in view of U.S. Patent No. 3,582,637 to Cecil, Jr. for a MOUNTING ARRANGEMENT FOR A FIBER OPTIC READER AND LAMP ASSEMBLY, hereafter referred to as "Cecil".

The Applicant acknowledges and respectfully traverses the raised rejections in view of the following remarks and in view of the claims amendments submitted herein above wherein pending claims 73-89 have been replaced by amended versions of claims 73-89, the amended claims being presented herein above as new claims 90-100.

First considering the present invention, the present invention as recited in the claims as amended herein is directed to a light emitting device with an integrated light conducting element and a method for fabricating the light emitting device.

According to the present invention and as recited in the claims, the light emitting device includes a containment sleeve forming a housing for a light emitting element wherein the length of the containment sleeve is greater than the width of the containment sleeve. The containment sleeve has an opening extending axially through the containment sleeve, and a light conducting

element extends axially into the containment sleeve opening so that an inner end of the light conducting element and an inner circumferential surface of the containment sleeve form a recess for receiving the light emitting element. The axial length of the light conducting element is preferably at least 50% of the overall axial length of the containment sleeve and light conducting element.

The inner end of the light conducting element forms a light receiving boundary surface whereby light generated by the light emitting element enters the light conducting element for passage along the light conducting element. In addition, the inner circumferential surface of the containment sleeve and the outer circumferential surface of the light conducting element have essentially identical traverse section shapes and dimensions in at least the region adjacent to the light emitting element. The light emitting element is located directly adjacent to and spaced apart from the light receiving boundary surface of the light conducting element, and conforms within the traverse section shape and dimensions of the inner circumferential surface of the containment sleeve and the outer circumferential surface of the light conducting element.

As a result, the light emitting element, the light conducting element and the containment sleeve in at least a region adjacent the light emitting element together form a unitary optically integrated unit. Stated another way, the present invention effectively integrates the light emitting element into the light conducting element to form a single, integrated and unitary element by placing the light emitting element into a chamber formed at and around the end of the light conducting element so as to conform to the dimensions and cross sectional shape of the light conducting element. In the preferred embodiment, the chamber containing the light emitting element is comprised of the containment sleeve and the light conducting element and the light conducting element is fused into the containment sleeve so that the containment sleeve and light conducting element form a single structure. The chamber containing the light emitting element is thereby effectively formed within the end of the light conducting element to provide improved optical coupling, that is, transfer of light, between the light emitting element and the light conducting element.

Next considering the prior art cited by the Examiner, Verderber describes a hand held light having the ability to dissipate substantial heat generated by a high intensity light source so that the light does not become uncomfortable to hold during use. According to Verderber, this is accomplished by enclosing the light source within a handle having a heat sink shrouding the light source and an outer wall containing slots 17 so that the natural convection movement of air carries heat from the light source away from the handle. The light from the light source, in turn, is conducted to the desired area by means of a light rod, which may be shaped as necessary for the desired illumination.

Considering Verderber in further detail, it may be seen that in direct contrast from the present invention the light source is not effectively integrated within the light conducting element by being enclosed in a recess or plenum formed at and around the end of the light conducting element and conforming to the cross sectional shape and dimensions of the light conducting element. Instead, and because Verderber requires that the light source be replaceable, the lamp 40 is and must be separate from the light conducting element, that is, the light rod 32, rather than forming an integral unit with the light conducting element. For the same reasons, the lamp 40 is and must contained within a chamber that is also separate from the light conducting element, rather than being an integral unit with the light conducting element.

In this regard, it must be noted that in the present invention the chamber formed by the containment sleeve and the end of the light conducting element form a plenum chamber for the light emitting element when the opposite end of the chamber has been closed. In contrast from the present invention, the light emitting element in Verderber is a completely self contained lamp, as is conventional, that includes both a light emitting element and a plenum chamber formed about the light emitting element by the glass envelope of the lamp. As a consequence, it would be difficult to orient and place the light emitting element of lamp 40 into an optimum position with respect to the light rod so as to provide the maximum transfer of light from the lamp 40 and into the light rod 32. That is, and because of the structure necessarily adopted by Verderber in order to meet Verderber's desired goals, the positioning of the lamp 40 relative to

the end of the light rod 32 and the dimensions of the chamber containing lamp 40 are largely controlled and determined by the dimensions and shape of the glass envelope of lamp 40 rather than by any other considerations, such as positioning with respect to the light rod in order to achieve maximum light transfer. This problem is compounded because since lamp 40 is to be replaceable and, as a result, the actual position of the lamp 40 will tend to vary from lamp 40 to lamp 40 and whenever a lamp 40 is inserted into the device.

It must also be noted that, as a further consequence of the above discussed factors, there will be an increased number of corners, angles and so forth in Verderber's lamp chamber simply because the components, such as the lamp, light rod and lamp chamber, typically cannot be custom designed to fit together without corners resulting from the different dimensions of the elements, such as differences between the diameters of the lamp and light rod. Examples of such corners and angles are clearly shown in Verderber, such as the junction between the portion of the tube containing the light rod and the lamp chamber and at the corners behind the lamp. Such corners and angles thereby increase the number of light traps and thereby reduce the proportion of light directed into the light rod. Also, and because in Verderber the chamber sealing behind the lamp 40 is required to function to exclude moisture rather than to reflect light, the amount of light reflected within Ververder's lamp chamber will be further reduced, as will the proportion of light reflected into the light rod.

As a result, therefore, Verderber does not and cannot teach or suggest a light emitting device or a method for fabricating a light emitting device wherein the light emitting element is effectively integrated into the light conducting element to form a single, integrated and unitary element and, in particular, wherein the light emitting element resides in a chamber formed at and around the end of the light conducting element so as to conform to the dimensions and cross sectional shape of the light conducting element. Verderber therefore cannot and does not teach of suggest any element of the fundamental structure of the light emitting device of the present invention, or the method for fabricated the light emitting device of the present invention.

It is therefore the belief and position of the Applicant that the present invention as recited in the claims as amended herein are fully and patentably distinguished over the teachings and suggestions of Verderber under the requirements and provisions of both 35 U.S.C. 102 and 35 U.S.C. 103. The Applicant therefore respectfully requests that the Examiner reconsider the present Application and enter the amendments submitted herein, that the Examiner reconsider and withdraw all rejections of the claims as amended herein over Verderber under both 35 U.S.C. 102 and 35 U.S.C. 103, and the allowance of the claims as amended herein.

Next considering Verderber in view of Ghandehari, Verderber has been discussed above, and that discussion will therefore not be repeated here but the distinctions between the present invention and Verderber should be taken as incorporated into all following discussions.

The Examiner has cited Ghanderhari with regard to controlling or changing the color of a light source and in particular with regard to previously pending claims 78 and 89, the subject matter of which now appears in new claim 95. Ghanderhari describes a light source for fiber optics wherein light and heat are emitted by a source 5 and wherein the heat is removed,.or filtered, by a heat rejection means 30, such as a cold mirror, with the light being reflected through a focusing lens 40 and various filters 140,110 and apertures and into a light conduit 60. It will be apparent, therefore, that Ghanderhari does not and cannot teach or suggest any of the elements of the present invention as recited in new independent claims 90 and 99. In particular, Ghanderhari does not and cannot teach or suggest a light emitting device or a method for fabricating a light emitting device wherein the light emitting element is effectively integrated into the light conducting element to form a single, integrated and unitary element and, in particular, wherein the light emitting element resides in a chamber formed at and around the end of the light conducting element so as to conform to the dimensions and cross sectional shape of the light conducting element. It will also be noted that Ghanderhari is also directed to entirely different goals and functions from the present invention. That is, the present invention is directed to a light emitting device having efficient transfer of emitted light from a light emitting element and into a light conducting element. Ghanderhari, in contrast, is directed to a light

source allowing spectrum elements appearing in the light to be controlled. In this regard, and in illustration of the fundamental distinctions between the present invention and Ghanderhari, it must be noted that the fundamental design of Ghanderhari's device is such as to result in very large losses of light from reflection off of surfaces, absorption in various filters, and leakage from the light path.

So far as Ghanderhari is pertinent to the present invention, therefore, Ghanderhari is pertinent only in suggesting that the color spectrum of light emitted from a source may be controlled by means of appropriate filters. While the present invention does not rule out the use of various filters with the light emitting device of the present invention, the use of such filters is not a part of the present invention in any respect or for any purpose. Instead, the specification of the present application describes that light emitting devices of present invention as recited in claims 90 and 99 by combination of a plurality of light emitting devices of the present invention, each emitting a corresponding color of light. As described in the application, this result may be achieved by combining two or more light emitting elements in a light emitting device of the present invention, or by joining the light emitted from a plurality of light emitting devices of the present invention, for example by routing together the light conducting elements of the light emitting devices.

It will be appreciated that the method and apparatus of the present invention for generating a plurality of light colors is thereby fundamentally different from that taught by Ghanderhari, which generates employs a single broad spectrum light source and filters out all of the undesired light spectrum components. It will also be appreciated that not only is Ghanderhari's mechanism fundamentally different in nature, structure and operation from that of the present invention, but Ghanderhari's mechanism will be significantly less efficient in every respect than that of the present invention.

Ghanderhari, therefore, cannot and does not teach of suggest any element of the fundamental structure of the light emitting device of the present invention, or the method for

fabricated the light emitting device of the present invention under the requirements and provisions of 35 U.S.C. § 103 or of 35 U.S.C. § 102.

Also, it will be appreciated that while Ghanderhari may be combined with Verderber, by adding filters and a filter wheel somewhere along Verderber's light rod path, either at the input to the light rod or at the output of the light rod, neither Verderber nor Ghanderhari, taken individually or in any combination, can or do teach of suggest the device or method of the present invention, which has been described in detail above, to those of ordinary skill in the arts under the requirements and provisions of 35 U.S.C. § 103, or of 35 U.S.C. § 102.

It is, therefore, the belief and position of the Applicant that the present invention as recited in the claims as amended herein are fully and patentably distinguished over the teachings and suggestions of Verderber in view of Ghanderhari under the requirements and provisions of both 35 U.S.C. § 102 and 35 U.S.C. § 103. The Applicant therefore respectfully requests that the Examiner reconsider the present application and enter the amendments submitted herein, that the Examiner reconsider and withdraw all rejections of the claims as amended herein over Verderber in view of Ghanderhari under both 35 U.S.C. § 102 and 35 U.S.C. § 103, and the allowance of the claims as amended herein.

Next considering the rejection of claim 81 under 35 U.S.C. § 103(a) over Verderber in view of Cecil, it will be noted that the subject matter of previously pending claim 81 now appears in new claims 97 and 98. The Examiner cites Cecil as teaching that an enclosure for a light emitting element may be made of glass, while claims 97 and 98 recite that the light conducting element or containment sleeve of the light emitting device of claims 90 and 99, or both, may be made of fused quartz or other glass like material.

It should first be noted with respect to Cecil that the device described by Cecil, a fiber optic reader and lamp assembly, is fundamentally and basically different from the present invention in structure, function and operation. Cecil is thereby pertinent to the present invention only with respect to stating that an enclosure for a light emitting element may be made of glass,

and Cecil has no other teachings or suggestions pertinent in any way to any aspect of the present invention.

It must also be noted that claims 97 and 98, which recite the use of fused quartz or other glass like material for the light conducting element or containment sleeve of the present invention, are both dependent from new claim 90, which recites the structure of the light emitting device of the present invention. Claims 97 and 98 thereby incorporate all recitations of claim 90 by virtue of dependence therefrom, and operate to add further limitations and elements to the recitations of claim 90.

As discussed above, the present invention as recited in claims 90 and 99 are fully distinguished over the teachings of Verderber and Ghandehari under the requirements and provisions of 35 U.S.C. § 102 and 35 U.S.C. § 103, and is fully distinguished over the teachings of Cecil and Verderber in view of Cecil under the requirements and provisions of 35 U.S.C. § 102 and 35 U.S.C. § 103 for the same reasons. As such, claims 97 and 98 are patentably distinguished over Verderber in view of Cecil under the requirements and provisions of 35 U.S.C. § 102 and 35 U.S.C. § 103 by virtue of being dependent from claim 90, which is patentably distinguished over Verderber in view of Cecil under both 35 U.S.C. § 102 and 35 U.S.C. § 103.

It is, therefore, the belief and position of the Applicant that the present invention as recited in new claims 97 and 98 are fully and patentably distinguished over the teachings and suggestions of Verderber in view of Cecil under the requirements and provisions of both 35 U.S.C. § 102 and 35 U.S.C. § 103. The Applicant, therefore, respectfully requests that the Examiner reconsider the present application and enter the amendments submitted herein, that the Examiner reconsider and withdraw all rejections of the claims as amended herein over Verderber in view of Cecil under both 35 U.S.C. § 102 and 35 U.S.C. § 103, and the allowance of the claims as amended herein.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) and the finality of the present action should be withdrawn and the present response and the claims as

amended herein entered into the present application, and that this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,

Gary D. Clapp, Reg. No. 29,055
Customer No. 020210
Davis & Bujold, P.L.L.C.
Fourth Floor
500 North Commercial Street
Manchester NH 03101-1151
Telephone 603-624-9220
Facsimile 603-624-9229
E-mail: patent@davisandbujold.com

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service, with sufficient postage, as First Class Mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on October 22, 2002 .

By: _____

Print Name: Gary D. Clapp